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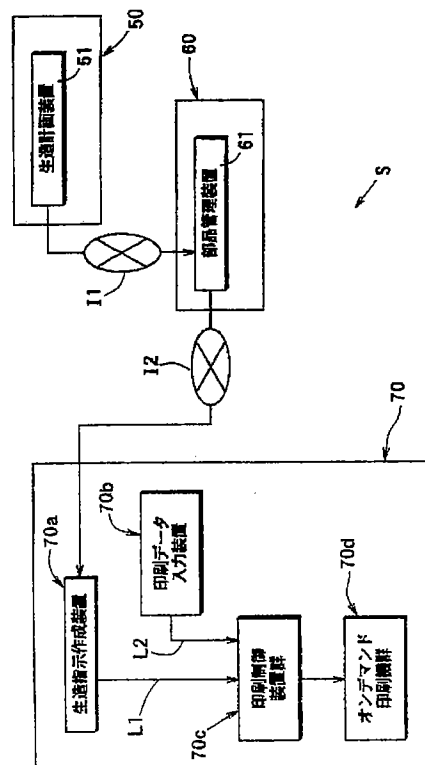
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(54) 【発明の名称】 車両の表示装置用表示板の製造方法及び製造システム

(57) 【要約】

【課題】 印刷版を用いず迅速かつ低コストにて多品種小ロット印刷を可能とするオンデマンド印刷手法の用い方に工夫を凝らし、スクリーン印刷した実質的に同様の表示板を製造するようにした車両の表示装置用表示板の製造方法及び製造システムを提供する。

【解決手段】 車両製造計画部門50の製造計画装置51により各表示装置の表示板の製造指示データを通信回線I1を介し出力し、組立工場60の部品管理装置61により当該製造指示データを通信回線I2を介し印刷工場70の製造指示作成装置70aに出力する。印刷制御装置群70cは、製造指示作成装置70aからの製造指示データ及び印刷データ入力装置70bからの表示板のデザインデータに基づき、オンデマンド印刷機群70dに、当該デザインデータを、透明基板の表面に印刷層として印刷させる。



# PATENT ABSTRACTS OF JAPAN

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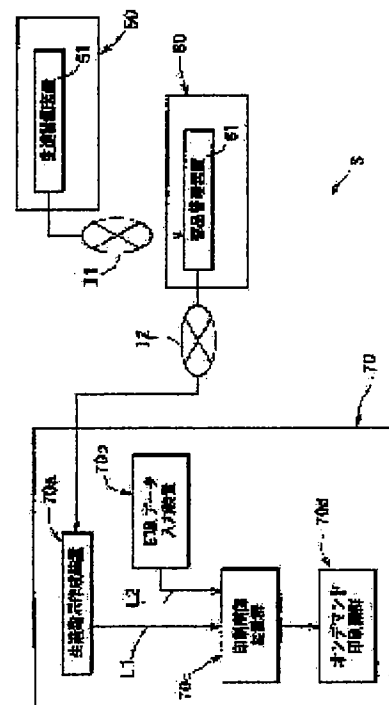
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## (54) MANUFACTURING METHOD AND MANUFACTURING SYSTEM OF DISPLAY PLATE FOR DISPLAY DEVICE OF VEHICLE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a manufacturing method and a manufacturing system of a display plate for a display device of a vehicle which manufactures substantially the same display plate applying screen printing thereto by devising usage of an on-demand printing method making a small lot and variety of printing possible promptly at a low cost without using a print plate.

**SOLUTION:** Manufacturing instruction data of the display plate in each display device are outputted by a manufacturing planning device 51 of a vehicle manufacturing planning department 50 through a communication line I1, and the manufacturing instruction data are outputted to a manufacturing instruction preparing device 70a of a print shop 70 by a parts management device 61 of an assembly plant 60 through a communication line I2. Based on the manufacturing instruction data from the manufacturing instruction preparing device 70a and design data of the print plate from a print data input device 70b, a print controlling device group 70c prints the design data on a surface of a transparent substrate in an on-demand printing machine group 70d as a print layer.



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[Claim(s)]

[Claim 2] Prepare two or more common negatives required for manufacture of the plotting board (M) of each display with which various cars are equipped, respectively for the field of a transparency substrate (10) with the configuration in which the binder layer (20) was formed, and it sets into a car manufacturing-planning section (50). Output the manufacture directions data of the display board of each of said indicating equipment through a communication line (I1) in the end of a car manufacturing-planning section side edge with a means (51), and it sets to a components manufacturing department (60 70). Said each manufacture directions data outputted through said communication line in said end of a car manufacturing-planning section side edge from a means is inputted with a means (61, I2, 70a) in the end of a components manufacturing department side edge. Based on each [ these ] input manufacture directions data, the manufacture directions plan of the display board of each of said indicating equipment is drawn up as manufacture directions plan data with a means in said end of a components manufacturing department side edge. It is based on this manufacture directions plan data. With a print-on-demand means (70c, 70d) The manufacture approach of the display board for indicating equipments of a car of printing the design data of the display board of each of said indicating equipment as each printing layer (30) on the front face of the binder layer of each of said negative, respectively, and having manufactured said each display board.

[Claim 4] A common negative required for manufacture of the plotting board (M) of each display with which various cars are equipped, respectively with the configuration in which the binder layer (20) was formed to the field of a transperence substrate (10) Plurality and the negative

storage means to keep, The car manufacturing-planning section equipped with a means (51) in the end of a car manufacturing-planning section side edge the manufacture directions data of the display board of each of said indicating equipment are outputted through a communication line (I1), respectively (50), Said each manufacture directions data outputted through said communication line in said end of a car manufacturing-planning section side edge from the means is inputted, and the manufacture directions plan of the display board of each of said indicating equipment is used as manufacture directions plan data based on each input manufacture directions data concerned. a print-on-demand means (70c --) to print the design data of the display board of each of said indicating equipment as a printing layer (30) on the front face of the binder layer of each of said negative based on [ the end of a components manufacturing department side edge it creates ] a means (61, I2, 70a) and said manufacture directions plan data, respectively The manufacturing system of the plotting board for displays of the car possessing the components manufacturing department (60 70) having 70d.

[Claim 5] A means is the manufacturing system of the plotting board for displays of the car according to claim 4 characterized by being characterized by interlocking like the erector of each of said display and creating said manufacture directions plan data in said end of a components manufacture side edge.

[Claim 6] It is the manufacturing system of the display board for displays of the car according to claim 4 or 5 which is equipped with a record means (70b) to record said design data of said display board, and is characterized by said print-on-demand means printing said printing layer based on the record data of said record means.

[Claim 7] It has the car sales division (80) which has a means (80a) in the end of a car sales division side edge. In said end of a car sales division side edge a means The inside of two or more design data for display boards in consideration of liking of a car purchaser, The design data chosen by the car purchaser concerned is outputted to said end means of a car production-planning side edge through other communication lines (I3). In said end of a car manufacturing-planning side edge a means The manufacturing system of the plotting board for displays of the car according to claim 6 characterized by including and outputting said selection design data to said manufacture directions plan data.

[Claim 8] Said print-on-demand means is the manufacturing system of the plotting board for displays of the car according to claim 7 characterized by printing the printing layer concerned so that it may have the adjustable information bureau (30d, 30e) to which said printing layer expresses the adjustable information about a car at the periphery edge.

[Claim 9] It is the manufacturing system of the plotting board for displays of the car according to claim 8 characterized by for said car being a limited plan vehicle and the adjustable information of said adjustable information bureau being the limited number of the limited plan vehicle concerned.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the manufacture approach of the plotting boards for displays, such as an instrument, and manufacturing system with which cars, such as an automobile, are equipped.

[0002]

[Description of the Prior Art] In manufacture of the instrument board formed in the instrument for the former, for example, passenger cars, a printing layer is screen-stenciled and formed in the front face of resin transparence substrates, such as a polycarbonate, so that it may have the translucent part which consists of a graduation or an alphabetic character in the non-translucent part as a background.

[0003] He is trying to display brightly only the alphabetic character and graduation which are a translucent part among the instrument boards with arranging in the rear-face side of the instrument board, and illuminating the instrument board concerned according to the light source in Nighttime, by this.

[0004]

[Problem(s) to be Solved by the Invention] By the way, according to the software for the Adobe image processings used by McIntire sleeve GUTOSSHU computer by Apple Computer, Inc., it is possible to perform a digital design simple as it is also with a computer and a monitor in recent years. here, even if it is going to screen-stencil screen-stencil directly on the front face of a transparence substrate using the digital design data expressing a color by crossing of cyanogen, magenta, yellow, and 4 color dot of black since it is the approach of coming [ an individual color prints, unites and ] out of and expressing for example, it is difficult.

[0005] It is screen-stencil, for example, when performing 8 color printing, the color currently formed in the combination of the four above-mentioned color must completely be treated as another color of eight colors according to an individual, and the ink adjusted in each must be chosen, and, specifically, the printing version must be manufactured. Therefore, manufacture of the printing version and the color matching of the ink equivalent to this printing version are needed, and it takes time amount very much, so that there is much color number.

[0006] Furthermore, since screen-stencil requires time amount for housekeeping of printing preparations, such as manufacture of the printing version, when it is a product with few printing, the make-ready time cuts it in many rather than printing time amount. Therefore, in order to reduce the manufacturing cost of the instrument board, the printed instrument board must be held as an inventory.

[0007] especially , in the case of a passenger car , but it be displacement , grade , and a difference call an overseas destination specification etc. further , and only the contents of a display of the instrument board differ often [ with the same vehicle name ] , and in fact , if printing interlocked with the order quantity from the manufacturer of a passenger car be carry out , the manufacture number of the instrument of a day have many things of 100 or less per kind , and be hold many technical problems , such as printing cost , stock control , and lead time .

[0008] Furthermore, the above-mentioned technical problem serves as a failure, and various correspondences of carrying out numbering of adopting the gauge board with which the customized passenger car was increasing while diversification of a passenger car progressed, and the contents of a display were also customized, or the copy number are difficult.

[0009] It is possible to adopt the real-time printing technique (the so-called print-on-demand technique) which is spreading in the quotient printing field to this in recent years. Unlike the screen-stencil technique, this print-on-demand technique is excellent in quick and the point which enables multi-form smallness lot printing with low cost not using the printing version. However, since this print-on-demand technique mainly aims at printing on paper, it is not suitable for printing deeply the concentration of printing stably on the front face of the transparence substrate of the above resins which need endurance, or a non-translucent part in principle.

[0010] Then, not using the printing version, how to use the print-on-demand technique which enables multi-form smallness lot printing in low cost is elaborated, and this invention aims at quick and offering the manufacture approach of the plotting board for displays of a car and manufacturing system which were screen-stenciled and which manufactured the same plotting board substantially to it in order to cope with the above mentioned.

[0011]

[Means for Solving the Problem] By the manufacture approach of the plotting board for displays of the car concerning invention according to claim 1, in solution of the above-mentioned technical problem Prepare two or more common transparence substrates (10) required for manufacture of the plotting board (M) of each display with which various cars are equipped, respectively, and they are set into a car manufacturing-planning section (50). Output the manufacture directions data of the display board of each indicating equipment through a communication line (I1) in the end of a car manufacturing-planning section side edge with a means (51), and it sets to a components manufacturing department (60 70). Each manufacture directions data outputted through a communication line in the end of a car manufacturing-planning section side edge from a means is inputted with a means (61, I2, 70a) in the end of a components manufacturing department side edge. Based on each [ these ] input manufacture directions data, the manufacture directions plan of the display board of each indicating equipment is drawn up as manufacture directions plan data with a means in the end of a components manufacturing department side edge. Based on this manufacture directions plan data, with a print-on-demand means (70c, 70d), the design data of the display board of each indicating equipment is printed as each printing layer (30) to the field of each transparence substrate, respectively, and each display board is manufactured.

[0012] Thereby, manufacture of the plotting board is attained at short time for delivery through a help or a document. Moreover, since print on demand is used in printing of the printing layer to a transparence substrate, the printing concerned is performed as required, when required. As mentioned above, not using the printing version, the same quick and plotting board as the real target which also screen-stenciled multi-form smallness lot printing in low cost can be manufactured.

[0013] moreover, by the manufacture approach of the plotting board for displays of the car concerning invention according to claim 2 Prepare two or more common negatives required for manufacture of the plotting board (M) of each display with which various cars are equipped, respectively for the field of a transparence substrate (10) with the configuration in which the binder layer (20) was formed, and it sets into a car manufacturing-planning section (50). Output the manufacture directions data of the display board of each indicating equipment through a communication line (I1) in the end of a car manufacturing-planning section side edge with a means (51), and it sets to a components manufacturing department (60 70). Each manufacture directions data outputted through a communication line in the end of a car manufacturing-planning section side edge from a means is inputted with a means (61, I2, 70a) in the end of a components manufacturing department side edge. Based on each [ these ] input manufacture directions data, the manufacture directions plan of the display board of each indicating equipment is drawn up as manufacture directions plan data with a means in the end of a

components manufacturing department side edge. Based on this manufacture directions plan data, with a print-on-demand means (70c, 70d), the design data of the display board of each indicating equipment is printed as each printing layer (30) on the front face of the binder layer of each negative, respectively, and each display board is manufactured.

[0014] Since a printing layer is printed to a transparence substrate through a glue line also by this using print on demand not to mention the ability to attain the operation effectiveness of invention according to claim 1, a printing layer pastes the field of a transparence substrate certainly by the glue line. Therefore, a printing layer makes it stable to a transparence substrate also by print on demand.

[0015] Moreover, in invention according to claim 3, manufacture directions plan data are characterized by interlocking like the erector of each display and being created in a means in the end of a components manufacturing department side edge in the manufacture approach of the display board for displays of a car according to claim 1 or 2.

[0016] Thereby, the assembly of the display after manufacture of the plotting board can carry out without futility not to mention the ability to attain the operation effectiveness of invention according to claim 1 or 2.

[0017] moreover, in the manufacturing system of the plotting board for displays of the car concerning invention according to claim 4 A common negative required for manufacture of the plotting board (M) of each display with which various cars are equipped, respectively with the configuration in which the binder layer (20) was formed to the field of a transparence substrate (10) Plurality and the negative storage means to keep, The car manufacturing-planning section equipped with a means (51) in the end of a car manufacturing-planning section side edge the manufacture directions data of the display board of each indicating equipment are outputted through a communication line (I1), respectively (50), In the end of a components manufacturing department side edge each manufacture directions data outputted through the communication line in the end of a car manufacturing-planning section side edge from the means is inputted, and the manufacture directions plan of the display board of each indicating equipment is drawn up as manufacture directions plan data based on each input manufacture directions data concerned A means (61, I2, 70a), The components manufacturing department (60 70) having a print-on-demand means (70c, 70d) to print the design data of the display board of each indicating equipment as a printing layer (30) on the front face of the binder layer of each negative based on manufacture directions plan data, respectively is provided.

[0018] Thereby, the manufacturing system of the plotting board for displays of the car which can attain the operation effectiveness of invention according to claim 2 can be offered.

[0019] Moreover, in invention according to claim 5, a means is characterized by interlocking like the erector of each indicating equipment and creating manufacture directions plan data in the end of a components manufacture side edge in the manufacturing system of the display board for indicating equipments of a car according to claim 4.

[0020] Thereby, the assembly of the display after manufacture of the plotting board can carry out without futility not to mention the ability to attain the operation effectiveness of invention according to claim 4.

[0021] Moreover, in invention according to claim 6, in the manufacturing system of the display board for indicating equipments of a car according to claim 4 or 5, it has a record means (70b) to record the design data of a display board, and a print-on-demand means is characterized by printing a printing layer based on the record data of a record means.

[0022] This can also attain the same operation effectiveness as invention according to claim 4 or 5.

[0023] Moreover, in invention according to claim 7, it sets to the manufacturing system of the plotting board for displays of a car according to claim 6. It has the car sales division (80) which has a means (80a) in the end of a car sales division side edge. In the end of a car sales division side edge a means The inside of two or more design data for display boards in consideration of liking of a car purchaser, It is characterized by outputting the design data chosen by the car purchaser concerned to a means through other communication lines (I3) in the end of a car production-planning side edge, and a means including and outputting selection design data to

manufacture directions plan data in the end of a car manufacturing-planning side edge.

[0024] Thereby, the design data according to liking of a car purchaser is realizable for printing of the printing layer of the plotting board. Consequently, the operation effectiveness of invention according to claim 6 can be attained, filling liking of a car purchaser.

[0025] Moreover, in invention according to claim 8, in the manufacturing system of the display board for indicating equipments of a car according to claim 7, a print-on-demand means is characterized by printing the printing layer concerned so that it may have the adjustable information bureau (30d, 30e) to which a printing layer expresses the adjustable information about a car at the periphery edge.

[0026] Thereby, not to mention the ability to attain the operation effectiveness of invention according to claim 7, sense of superiority, such as a feeling of discrimination, can be given to the purchaser of the car as it is also at the adjustable information on the plotting board.

[0027] In invention according to claim 9, in the manufacturing system of the plotting board for displays of a car according to claim 8, a car is a limited plan vehicle and adjustable information of an adjustable information bureau is characterized by being the limited number of the limited plan vehicle concerned.

[0028] This can also attain the same operation effectiveness as invention according to claim 8.

[0029] In addition, the sign in the parenthesis of each above-mentioned means shows correspondence relation with the concrete means of a publication to the operation gestalt mentioned later.

[0030]

[Embodiment of the Invention] Hereafter, 1 operation gestalt of this invention is explained based on drawing 1 thru/or drawing 5. Drawing 1 and drawing 2 show an example of manufacturing system S which manufactures the instrument board M of the instrument for passenger cars shown by drawing 3 and drawing 4. The instrument board M concerned is constituted by the transparence substrate 10, the binder layer 20, the printing layer 30, and the gloss adjustment layer 40 as drawing 4 shows.

[0031] The transparence substrate 10 is constituted by the tabular synthetic resin of transparence. Spreading formation of the binder layer 20 is carried out on the front face 11 of the transparence substrate 10 by the resin binder of transparence at the shape of a layer.

[0032] Printing formation is carried out on the front face 21 of the binder layer 20 by the print-on-demand approach mentioned later at the shape of a layer, and the printing layer 30 has circular vehicle speed display 30a and vehicle speed unit display 30b in background 30c, as drawing 3 shows this printing layer 30.

[0033] Vehicle speed display 30a is formed in the shape of radii considering the through hole section H1 as a core in the illustration center section in drawing 3 of background 30c. Along with the inner circumference of two or more several 32 graduations 31, this vehicle speed display 30a sets spacing, arranges, and is formed while setting the slit-like graduation 31 of two or more articles to a radial, setting spacing in the direction of radii and arranging. Moreover, vehicle speed unit display 30b is formed in both-ends-period \*\* of vehicle speed display 30a with the alphabetic character and the notation among background 30a. In addition, the through hole section H1 is formed in the direction of board thickness in the location shown in the instrument board M concerned by drawing 3 in the direction of board thickness.

[0034] Background 30c is a non-translucent part, and the inside of each graduation of vehicle speed display 30a and the profile of each number is formed as a translucent part in this non-translucent part, respectively. The gloss adjustment layer 40 is carried out on the front face 33 of the printing layer 30 with a lusterless ingredient, and printing formation is carried out by the print-on-demand technique at the shape of a layer. This gloss adjustment layer 40 plays the role which takes off the gloss produced by outdoor daylight on the front face 33 of the printing layer 30.

[0035] Next, the configuration of manufacturing system S which manufactures the instrument board M constituted as mentioned above is explained with reference to drawing 1 and drawing 2. Manufacturing system S is equipped with manufacture directions listing-device 70a which is the manufacturing-planning equipment 51 which is a terminal unit arranged into the manufacturing-



planning section 50, the parts control equipment 61 which is a terminal unit arranged to the assembly shop 60, and the terminal unit arranged to the printing works 70, print-data input-device 70b, print control unit group 70c, and 70d of print-on-demand machine groups.

[0036] Manufacturing-planning equipment 51 is equipped with the personal computer, the keyboard, and the display, and this manufacturing-planning equipment 51 carries out through transmission of the public line I1 for manufacture order directions of various kinds of gauge boards containing a gauge board M as manufacture order directions data from a personal computer at the parts control equipment 61 of an assembly shop 60 based on actuation of a keyboard.

[0037] Parts control equipment 61 manages the existence of arrangements of the instrument board of each instrument, and components other than this instrument board, and the assembly progress of an instrument and the assembly of an instrument. In this management, the parts control equipment 61 concerned analyzes the manufacture order directions data from manufacturing-planning equipment 51 on the so-called basis of a can van method, and transmits this analysis data to manufacture directions listing-device 70a of the printing works 70 through a public line I2.

[0038] Here, the analysis of the above-mentioned manufacture order directions data in parts control equipment 61 is made as follows. if parts control equipment 61 receives manufacture order directions data from manufacturing-planning equipment 51, the unofficial announcement information (monthly manufacturing planning is expressed) and the definite information (Japanese -- the next manufacturing planning is expressed) about each instrument board based on this manufacture order directions data will calculate, and the number of sheets of a required can van will be computed based on these unofficial announcement information and definite information. In an assembly shop 60, in the assembly of each instrument, calculation of the number of sheets of this can van is held in the conveyance box to which the gauge board required to assemble each instrument like without excess and deficiency gave the can van of correspondence, and it is performed so that it may be conveyed from the printing works 70 in an assembly shop 60. In addition, a number of each can van computed in parts control equipment 61 is given to each empty conveyance box, respectively, and is conveyed from an assembly shop 60 at the printing works 70.

[0039] Manufacture directions listing-device 70a is equipped with the personal computer, the keyboard, and the display, and according to the manufacture order directions data from the parts control equipment 61 through a public line I2, this manufacture directions listing-device 70a calculates the optimal order schedule of each instrument board as components with a personal computer based on actuation of a keyboard, draws up manufacturing planning to each instrument board, and outputs it to print control unit group 70c through a communication line L1 as each manufacturing-planning data from the personal computer concerned. Here, like the erector of an assembly shop 60, it interlocks and formulation of the above-mentioned manufacturing planning is made, as shown also in the above-mentioned can van method. In addition, each above-mentioned manufacturing-planning data is specified by the lot number 789-001 of each instrument board thru/or the manufacture number of sheets of 789-004 grade or each [ these ] instrument board, the manufacture date, etc. so that it may illustrate in drawing 2 .

[0040] Print-data input-device 70b is equipped with the personal computer, the keyboard, and the display, and the input storage of the design data for printing of various kinds of gauge boards is carried out in this print-data input-device 70b at the personal computer based on actuation of a keyboard. Moreover, according to actuation of a keyboard, print-data input-device 70b reads each design data for printing concerned from a personal computer, and outputs it to print control unit group 70c through a communication line L2. In addition, each above-mentioned design data for printing is specified, respectively from the lot number 789-001 each printing design data D1 corresponding to 789-004 thru/or D5 grade of each gauge board so that it may illustrate in drawing 2 .

[0041] As drawing 2 shows print control unit group 70c, it is constituted by two or more print control units C1 thru/or Cm, and each design data is inputted into it through a communication line L2 from print-data input-device 70b while each manufacturing-planning data is inputted into

each [ these ] print control unit C1 thru/or Cm through a communication line L1 from the personal computer of manufacture directions listing-device 70a.

[0042] Here, each print control units C1, C2, C3, C4, and C5 and ... correspond to the lot number 789-001 of each instrument board, 789-002, 789-003, 789-004, 789-005, and ..., respectively. Therefore, each above-mentioned manufacturing-planning data is inputted into each print control unit C1 of correspondence thru/or Cm at the manufacture date, respectively. Moreover, the input of each design data is performed in accordance with each above-mentioned manufacturing-planning entry of data from print-data input-device 70b.

[0043] Each print control unit C1 thru/or Cm are controlled to drive each print-on-demand machine of correspondence based on each of that input data among two or more print-on-demand machines P1 which constitute 70d of print-on-demand machine groups thru/or Pm (to refer to drawing 2 ).

[0044] In response to each print control unit C1 of correspondence thru/or control by Cm, by the print-on-demand approach, each print-on-demand machine P1 thru/or Pm print a printing layer in the binder layer of each instrument board, and prints a gloss adjustment layer on the front face of each printing layer the appropriate back. For example, if a gauge board M is a gauge board of a lot number 789-001, the design data of the printing layer of this gauge board M is specified by design data D1. Therefore, the print-on-demand machine P1 prints the printing layer of the instrument board M on the front face of a binder layer according to design data D1 with a print control unit C1, and prints a gloss adjustment layer on the front face of the printing layer concerned the appropriate back. In addition, each gauge board printed in this way is held in the conveyance box which attached the can van of correspondence, and is conveyed in an assembly shop 60.

[0045] Next, how to manufacture each instrument board of instrument board M and others by manufacturing system S is explained.

[0046] At the printing works 70, the tabular polycarbonate (Mitsubishi Gas Chemical Co., Inc. make) of transparence is adopted as the above-mentioned tabular synthetic resin, this tabular synthetic resin is cut in a predetermined configuration, and transparence substrate 10A (refer to drawing 5 ) is formed. This transparence substrate 10A is equivalent to four sheets of the above-mentioned transparence substrate 10. In addition, the above-mentioned tabular synthetic resin may be the polyethylene terephthalate of not only the polycarbonate of transparence but transparence, nylon, ABS, etc.

[0047] Next, a polyester system resin binder (it has an elastic modulus  $5 \times 10^5$  at 80 degrees C) is adopted as a resin binder of transparence, the resin binder of this transparence is applied to the front face of transparence substrate 10A in the shape of a layer by the thickness of 20 micrometers thru/or 30 micrometers, and binder layer 20A is formed. The above-mentioned resin binder can maintain the adhesiveness between several months, where a volatile component is flown. In addition, as a formation ingredient of this binder layer 20A, you may be a translucency binder, without restricting to a resin binder.

[0048] Thus, after forming binder layer 20A, structure which formed binder layer 20A in transparence substrate 10A is used as a negative, a proper package is performed to this negative, and it is beforehand kept as an inventory to the printing works 70. In addition, only the thing reason used common to each instrument and the number of sheets decided by the number of sheets of the above-mentioned can van are formed, and the above-mentioned negative is kept.

[0049] If output data are transmitted to manufacture directions listing-device 70a from parts control equipment 61 through a public line I2 at the printing works 70 in such the condition, according to the output data concerned, this manufacture directions listing-device 70a will draw up manufacturing planning of each gauge board, and will output it to each print control unit C1 of correspondence thru/or Cm through a communication line L1, respectively as each manufacturing-planning data.

[0050] Moreover, print-data input-device 70b outputs each design data corresponding to the basis of actuation of a keyboard, and each gauge board to each print control unit C1 of correspondence thru/or Cm from a personal computer, respectively. Then, each [ these ] print

control unit C1 thru/or Cm control each print-on-demand machine P1 thru/or Pm of correspondence according to each design data of the correspondence from each output data of the correspondence from manufacture directions listing-device 70a, and print-data input-device 70b, respectively.

[0051] If these contents of control are explained taking the case of the print-on-demand machine P1, printing formation of the printing layer 30A will be carried out on the front face of binder layer 20A at the shape of a layer. Here, printing layer 30A consists of four printing layers 30, as drawing 5 shows. Moreover, as a print-on-demand machine, an ink jet method printing machine or an electrophotography method printing machine (for example, laser beam printer) is adopted. However, to use a toner for the front face of binder layer 20A by the print-on-demand approach, and to print the configuration of printing layer 30A which the print-on-demand machine P1 mentioned above, the print control unit C1 is programmed and the above-mentioned print-on-demand machine P1 is controlled by this print control unit C1. In addition, the white toner adopted the pigment of a titanium oxide system or a silicon system among the above-mentioned toners, and the black toner adopted the carbon black system pigment.

[0052] A deer is carried out and the negative which is transparence substrate 10A in which binder layer 20A was formed as mentioned above is set to the above-mentioned print-on-demand machine P1. And the print-on-demand machine P1 concerned is controlled by the above-mentioned print control unit C1, and it prints that the above-mentioned toner is also so that it may become the configuration of printing layer 30A mentioned above on the front face of binder layer 20A of the above-mentioned negative. The light transmission concentration as a non-translucent part of background 30b is measured with DMby great Japan screen company 500 mold transmission density meter, and since it is [ 2.0 or more ] required, as for the count of printing of a black toner, it is desirable to consider as about 2 times or more.

[0053] The appropriate back, with the above-mentioned print-on-demand machine, a lusterless ingredient is printed in the shape of a layer on the front face of printing layer 30A, and gloss adjustment layer 40A (it consists of four gloss adjustment layers 40) is formed. With this operation gestalt, gloss adjustment layer 40A is formed by the following approach. That is, it is the approach of printing on the front face of binder layer 20A in the shape of a halftone dot, and printing in the shape of a laminating to homogeneity by the print-on-demand approach, using transparent ink or a transparent toner. Although it is necessary to lower the glossiness (the degree of gloss) of this gloss adjustment layer 40A to a predetermined value, in the instrument board for passenger cars, at 60 degrees C, it is desirable that it is 20 or less, and with [ the glossiness concerned ] ten [ or less ], it is still more suitable. It was made to have lightfastness by using transparence additives, such as a silica and acrylic resin powder, as the above-mentioned lusterless ingredient from such a viewpoint.

[0054] since the minute organization potency force of a halftone dot is as low as 40 thru/or 80 lines / inch (a line / 24.5mm) and a halftone dot is visible to a pattern in screen-stencil — general — a mat — material — although irregularity is given to the front face of a printing layer with the additive, since the minute nature 100 lines / more than an inch is obtained, according to the print on demand approach, it is possible to form that it is also in a transparent printing layer about homogeneity and a fine halftone dot, or a detailed pattern. Since these halftone dots or detailed patterns are very fine, an exterior is visible to lusterless processing. Moreover, it is not only suitable at the time of manufacture of a small printing lot, but according to such an approach, there is an advantage that data can also perform adjustment of glossiness.

[0055] A certain amount of thickness is required for the print-on-demand approach for forming the gloss adjustment layer concerned, and the print-on-demand approach using the ink or the toner which is not liquefied is suitable from a viewpoint which gives a feeling of irregularity. Specifically, the thermofusion mold hot printing approach or the electrophotography approach using a solid toner is suitable for formation of a gloss adjustment layer. Moreover, in order to raise the endurance of a printing layer to the gloss adjustment layer concerned, it is also possible to add UV absorbent. Moreover, the transparent material of a gloss adjustment layer does not necessarily need to be transparent, and may be an ingredient of coloring of the range which does not affect the print color of a substrate, or the color of a same color network.

[0056] After printing gloss adjustment layer 40A as mentioned above, this gloss adjustment layer 40A is quadrised in the direction of board thickness with printing layer 30A, binder layer 20A, and transperence substrate 10A. Thereby, two or more formation of the instrument board 30 is carried out. Manufacture of the instrument board concerned is completed by the above.

[0057] As mentioned above, printing layer 30A (30) is not directly printed on the front face of transperence substrate 10A (10). Since it was made to carry out printing formation, on the front face of binder layer 20A (20) which it comes to form in the front face of transperence substrate 10A (10) the printing layer 30A (30) concerned It may stick to the basis of the adhesive strength of binder layer 20A (20), and the front face of transperence substrate 10A (10) uniformly through binder layer 20A (20). Consequently, even if it uses the print-on-demand approach by the above-mentioned print-on-demand machine, printing layer 30A (30) does not exfoliate from transperence substrate 10A (10), respectively. Thereby, the stability of the repeat of printing and the adhesion of a color-material layer in printing layer 30A (30) can be improved stably.

[0058] Moreover, other form smallness lot printing is realizable in quick and low cost, canceling certainly the fault in the case of being based on the screen-stencil approach stated at the beginning of this specification in manufacture of the instrument board by using the print-on-demand approach in this way.

[0059] After manufacturing each gauge board as mentioned above, each [ these ] gauge board is held in the conveyance box which attached the can van of correspondence, and is conveyed to an assembly shop 60. This means that the instrument board required for the assembly of the instrument in the basis of a can van method and an assembly shop 60 can be supplied to the assembly shop 60 concerned with sufficient timing. Then, in this assembly shop 60, each instrument of correspondence is assembled using each instrument board conveyed from the printing works 70. At this time, the can vans corresponding to the gauge board used for this assembly are collected from a conveyance box.

[0060] The following results were obtained, when the instrument board manufactured so that it might incidentally have the same configuration as the above-mentioned instrument board except for the point in which binder layer 20A was formed, with the resin binder which has an elastic modulus  $8 \times 10^4$  at 80 degrees C was prepared as an example of a comparison and this example of a comparison was compared with the instrument board in the above-mentioned operation gestalt.

[0061] That is, even if it left the instrument board and the above-mentioned example of a comparison which were stated with the above-mentioned operation gestalt for 1000 hours within the ambient atmosphere with a% [ of humidity ] of 95, and a temperature of 65 degrees C, they showed neither of abnormalities. However, although the instrument board stated with the above-mentioned operation gestalt did not show abnormalities when it was left within a 100-degree C ambient atmosphere for 1000 hours, the above-mentioned example of a comparison showed abnormalities, and produced the float in the interface of a transperence substrate.

[0062] Although the quality of the material of a binder layer is selectable, since it generally became 80 degrees C or more from such an examination result by sunlight, heat dissipation of interior lighting and an electrical machinery and apparatus, etc. by passenger car according to the print-on-demand approach of a printing layer, thermal resistance was required, the resin whose elastic modulus in 80 degrees C is more than  $1 \times 10^5$  (Pa) was desirable, and it turned out also in 100 degrees C that the resin whose elastic modulus is more than  $1 \times 10^5$  (Pa) is still more suitable. Specifically, polyester system resin, urethane system resin, acrylic resin, etc. can adopt as formation ingredients of a binder layer.

[0063] Drawing 6 shows the 1st modification of the above-mentioned operation gestalt. In this 1st modification, as drawing 6 shows, print-data input unit 70b stated with the above-mentioned operation gestalt changes each design data D1 thru/or D5, and memorizes it in a personal computer so that can van information may be printed as bar code 30d in background 30c in the lower part of printing layer 30a. In the \*\*\*\* 1 modification, the above-mentioned can van information is specified by the manufacturing information of each instrument board. Other configurations are the same as that of the above-mentioned operation gestalt.

[0064] In the \*\*\*\* 1 constituted modification, it sets to the printing works 70. Thus, as

mentioned above It unites with manufacture directions listing-device 70a outputting each manufacturing-planning data to each print control unit C1 of correspondence thru/or Cm through a communication line L1, respectively. Print-data input unit 70b If each design data corresponding to the basis of actuation of a keyboard and each gauge board is outputted to each print control unit C1 of correspondence thru/or Cm from a personal computer, respectively Each [ these ] print control unit C1 thru/or Cm control each print-on-demand machine P1 thru/or Pm of correspondence according to each design data of the correspondence from each output data of the correspondence from manufacture directions listing-device 70a, and print-data input-device 70b, respectively.

[0065] When printing formation of the printing layer 30A will be carried out on the front face of binder layer 20A of the above-mentioned negative at the shape of a layer as the above-mentioned operation gestalt described if these contents of control are explained taking the case of the print-on-demand machine P1, as drawing 6 also shows each can van information, printing formation is carried out as bar code data 30d. Therefore, manufacture management of the instrument board using the conveyance box which was classified for every lot and attached the can van does to being also in a much more exact components manufacture situation. The other operation effectiveness is the same as the above-mentioned operation gestalt.

[0066] Drawing 7 shows the 2nd modification of the above-mentioned operation gestalt. In this 2nd modification, as drawing 7 shows, print-data input unit 70b stated with the above-mentioned operation gestalt changes each design data D1 thru/or D5, and memorizes it in a personal computer in background 30c, in the lower part of each printing layer 30a of printing layer 30A so that the edition number information linked to the sale number of a limited vehicle may be printed as bar code 30e. Other configurations are the same as that of the above-mentioned operation gestalt.

[0067] In the \*\*\*\* 2 constituted modification, it sets to the printing works 70. Thus, as mentioned above It unites with manufacture directions listing-device 70a outputting each manufacturing-planning data to each print control unit C1 of correspondence thru/or Cm through a communication line L1, respectively. The basis of print-data input-device 70b's actuation of a keyboard, When each design data corresponding to each gauge board is outputted to each print control unit C1 of correspondence thru/or Cm from a personal computer, respectively, each [ these ] print control unit C1 thru/or Cm Respectively, according to each design data of the correspondence from each output data of the correspondence from manufacture directions listing-device 70a, and print-data input-device 70b, each print-on-demand machine P1 thru/or Pm of correspondence is controlled.

[0068] When printing formation of the printing layer 30A will be carried out on the front face of binder layer 20A of the above-mentioned negative at the shape of a layer as the above-mentioned operation gestalt described if these contents of control are explained taking the case of the print-on-demand machine P1, as drawing 7 also shows each edition number information, printing formation is carried out as bar code data 30e. Therefore, the feeling of scarcity value to the owner of the passenger car concerned can be raised. The other operation effectiveness is the same as the above-mentioned operation gestalt.

[0069] Drawing 8 shows the 3rd modification of the above-mentioned operation gestalt. In this 3rd modification, order equipment 80a of a sales division 80 is adopted in manufacturing system S stated with the above-mentioned operation gestalt. This order equipment 80a is equipped with the keyboard 81, the personal computer 82, and the display 83. In the order equipment 80a concerned, it is based on actuation of a keyboard 81, a personal computer 82 chooses the design data of the printing layer of the favorite gauge board of the purchaser of a passenger car from two or more design data, and this selection design data is transmitted to manufacturing-planning equipment 51 through a public line I3. Here, since two or more above-mentioned design data are displayed on the basis of control with a personal computer 82 by the display 83, the above-mentioned favorite design data is chosen from these contents of a display. Other configurations are the same as that of the above-mentioned operation gestalt.

[0070] Thus, in \*\*\*\* 3 constituted modification, if favorite design data is transmitted to manufacturing-planning equipment 51 from order equipment 80a as mentioned above, this design

data will be manufacturing-planning equipment 51, and will be transmitted more to a manufacturing system 61 through a public line 11. Then, in addition to the data stated with the above-mentioned operation gestalt, this manufacturing system 61 also transmits the design data concerned to manufacture directions listing-device 70a through a public line 12.

[0071] In connection with this, each manufacturing-planning data also including manufacturing planning of the gauge board set as the object of the design data concerned is outputted to each print control unit C1 thru/or Cm by manufacture directions listing-device 70a. Then, each [ these ] print control unit C1 thru/or Cm control each print-on-demand machine P1 thru/or Pm of correspondence according to each design data of the correspondence from each output data of the correspondence from manufacture directions listing-device 70a, and print-data input-device 70b, respectively.

[0072] If the case where printing of the gauge board adopted as the instrument of the passenger car set as the object of the above-mentioned purchase is made by the print-on-demand machine P1 is taken for an example and here explains the contents of control, as the above-mentioned operation gestalt described, printing formation will be carried out to printing layer 30A being also at the above-mentioned favorite design data on the front face of binder layer 20A of the above-mentioned negative at the shape of a layer. Therefore, the information dispatch of the feeling of discrimination, such as sense of superiority to other owners, can be carried out by filling the design demand of the purchaser of the passenger car concerned of self. The other operation effectiveness is the same as the above-mentioned operation gestalt.

[0073] Drawing 9 and drawing 10 show the 4th modification of the above-mentioned operation gestalt. In this 4th modification, data call equipment group 70e is connected between print-data input unit 70b and print control unit group 70c which were stated with the above-mentioned operation gestalt. As drawing 10 shows the data call equipment group 70e concerned, it is constituted by two or more data call equipments E1 thru/or Em and drawing 10 shows each data call equipment E1 thru/or Em, respectively, specifically, it connects between each print control unit C1 of correspondence thru/or Cm and print-data input unit 70b.

[0074] Each data call equipment E1 thru/or Em are equipped with the personal computer, the keyboard, and the display, respectively. Each [ these ] data call equipment E1 thru/or Em Each design data outputted from print-data input-device 70b as the above-mentioned operation gestalt described To inputting into each print control unit C1 of correspondence thru/or Cm, in addition, the inside of the instrument board, For example, when there is a demand as a prototype or a special express article, based on actuation of a keyboard, each design data which had the demand from print-data input-device 70b in the personal computer is read, and it inputs into each print control unit C1 of correspondence thru/or Cm. Other configurations are the same as that of the above-mentioned operation gestalt.

[0075] Thus, in \*\*\*\* 4 constituted modification, when there is a demand among gauge boards as a prototype or a special express article, each data call equipment E1 thru/or Em read the design data which had the demand from print-data input-device 70b in the personal computer based on actuation of a keyboard for every data call equipment, and inputs it into the print control unit of correspondence. In connection with this, each print control unit C1 thru/or Cm carry out drive control of each print-on-demand machine P1 thru/or Pm of correspondence based on each of that input data. Thereby, a prototype and a special express article can be manufactured among the instrument boards for a short period of time. The other operation effectiveness is the same as the above-mentioned operation gestalt.

[0076] In addition, even if it adopted the thermofusion mold imprint method printing machine and carried out printing formation of the printing layer 30 on the front face of the binder layer 20 with this printing machine as a print-on-demand machine stated with the above-mentioned operation gestalt, the same printing layer 30 was able to be obtained with the above-mentioned operation gestalt having described. Here, as for the pigment system used for an ink ribbon, in a thermofusion mold imprint method printing machine, it is desirable from a light-fast point that it is the same pigment system as the thing of an electrophotography method. Although it is possible to make non-translucency higher than the thing of an electrophotography method by adjustment of the thickness of the ink layer of a ribbon, a pigment ratio, etc. from the point of

concentration, it is desirable to perform multiple-times printing of black printing material from the point of generating prevention of a pinhole. Moreover, in the case of a thermofusion mold imprint method, it has the thermofusion ink layer of an ink ribbon, and the mold release layer which receives the interface of base material polyester film imprint nature, but it is possible by adding mat material in this layer to lower the gloss on the front face of a print.

[0077] Moreover, although it was made to carry out printing formation also of the gloss adjustment layer 40 with a print-on-demand machine, it replaces with this and you may make it print on the front face of the printing layer 30 with a screen printer about the gloss adjustment layer 40 with the above-mentioned operation gestalt using Jujo Chemical 2 acidity-or-alkalinity lusterless clear ink. Thus, as for the manufactured instrument board, there is little change of glossiness in a 100-degree C ambient atmosphere, and it is suitable for it as the instrument board of the instrument exposed to hot environments according to installation situations, such as the light source.

[0078] Moreover, as the binder layer 20 and on-demand 30 are formed in the rear face of this transparence substrate, you may make it also give a role of a gloss adjustment layer to the transparence substrate 10 as a transparence substrate 10 using the tabular polycarbonate (MOBy Mitsubishi Gas Chemical Co., Inc. 1 mold) which has an embossing configuration on a front face. In addition, what coated the coating material which added the bead and mat material of predetermined grain size in advance is sufficient as the embossing configuration of the front face of a transparence substrate. In addition, when it got damaged and \*\*\*\*\* was taken into consideration, the detailed acrylic bead was the optimal as a bead of predetermined grain size.

[0079] Moreover, you may carry out by the following approaches, without restricting to the approach which stated formation of the gloss adjustment layer 40 with the above-mentioned operation gestalt in operation of this invention.

[0080] By the 1st approach, when a printing lot is to some extent large, mat clear ink is screen-stenciled on the front face of the binder layer 20. According to this approach, since it is not necessary to make the printing version for every printing pattern of the instrument board, it can print with the shared printing version. Since platemaking and a lithographic plate manufacture process are not needed each time, there is no big cost rise. Moreover, since the class of ink can be chosen, it is using heat-resistant high ink from the condensation by the-like factor for an environment of the toner of the printing layer formed of print on demand, or ink, for example, heat, humidity, and light, oxidation, etc. A printing layer can be protected. For example, as mat clear ink, the bridge formation mold ink of 2 acidity or alkalinity is effective.

[0081] There is the approach of carrying out the laminating of the film of the predetermined glossiness which has an adhesive layer and a glue line with a laminator etc. at ordinary temperature or an elevated temperature as the 2nd approach. According to this approach, since film thickness is securable, it is also possible to add many UV absorbers etc. and, in the case of the print on demand which can choose only a weak color material to ultraviolet rays, it is effective. As an example of a film, fluorine system films, such as the Du Pont TEDORA film and AFUREKKUSU by the Asahi glass company, are suitable from thermal resistance, lightfastness, etc., for example.

[0082] Moreover, in the printing layer of the instrument board stated with the above-mentioned operation gestalt, it screen-stencils in operation of this invention except for the field which contains a translucent part among backgrounds, and may be made to perform print on demand only to the field containing the above-mentioned translucent part.

[0083] Here, if screen-stencil uses together screen-stencil and print on demand as it prints the graduation section in which the part into which the contents of a display, such as a speedometer, are seldom changed will be printed by screen-stencil among the approach reason which can be manufactured by low cost, and the graduation section of the instrument board if the number of printing lots is large, for example, it tends to change the contents of a display by the displacement and the grade of a passenger car like the graduation section of a tachometer by the print-on-demand approach, manufacture of it by low cost will still be attained.

[0084] In this case, it is also possible not to print a printing layer directly to a transparence substrate, but to once print it on an easily-adhesive processing polyethylene terephthalate film

etc., and to imprint this film on the front face of a transparence substrate as an imprint foil. The case where the front face of a transparence substrate is not flat, and a transparence substrate are thick, and it is effective when trouble is in the conveyance system of a printing machine.

[0085] Moreover, the manufacturing-planning section 50 stated with the above-mentioned operation gestalt in operation of this invention may be a car manufacturer's manufacturing-planning section, and an assembly shop 60 may be a components manufacturer's assembly shop, and the printing works 70 may be the printing works of a printing firm. Moreover, the sales division 80 which stated in the 4th modification of the above may be a sales division of a selling firm.

[0086] Moreover, it is in charge of operation of this invention, and a public line I1 thru/or I3 should just be a certain communication lines by the cable or wireless.

[0087] Moreover, what is necessary is just the substrate which may penetrate light, such as colored transparence and translucence, without restricting the transparence substrate 10 transparently and colorlessly in operation of this invention.

[0088] Moreover, without restricting the above-mentioned negative for carrying out manufacture storage in operation of this invention at the printing works 70, it may be made to carry out manufacture storage at the components works 60, and may be made to carry out manufacture storage at subcontract works.

[0089] Moreover, generally this invention may be applied to the instrument board of the instrument for cars of an automobile and others, or the plotting board of a display, without restricting to the instrument board of the instrument for passenger cars in operation of this invention.

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[Translation done.]



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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing 1 operation gestalt of the manufacturing system of the gauge board concerning this invention.

[Drawing 2] It is the block diagram showing the configuration in the printing works of drawing 1 .

[Drawing 3] It is the front view of the instrument board.

[Drawing 4] It is the sectional view which meets four to 4 line in drawing 3 .

[Drawing 5] It is the partial fracture front view of the negative which has the four instrument boards.

[Drawing 6] It is the partial fracture front view showing the 1st modification of the above-mentioned operation gestalt.

[Drawing 7] It is the partial fracture front view showing the 2nd modification of the above-mentioned operation gestalt.

[Drawing 8] It is the partial block diagram showing the 3rd modification of the above-mentioned operation gestalt.

[Drawing 9] It is the partial block diagram showing the 4th modification of the above-mentioned operation gestalt.

[Drawing 10] It is the detail block diagram showing the 4th modification of the above.

[Description of Notations]

10 10A — 20 A transparence substrate, 20A — 30 A binder layer, 30A — Printing layer, 30d, 30e — A bar code, 50 — A car manufacturing-planning section, 51 — Manufacturing-planning equipment, 60 [ — A manufacture directions listing device 70b / — A print-data input device, 70c / — A print control unit group, 70d / — A print-on-demand machine group, 80 / — A sales division, 80a / — Order equipment, I1, I2, I3 / — A public line, M / — Instrument board. ] — An assembly shop, 61 — Parts control equipment, 70 — Printing works, 70a

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[Translation done.]